APPLYING THE ENVIRONMENTAL IDENTITY DEVELOPMENT MODEL IN PLACE-BASED EDUCATION: AN ONLINE RESOURCE GUIDE

By

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Abstract

I created an online resource guide for place-based education (PBE) informed by the Environmental Identity Development (EID) Model and research (Green et al., 2016). The EID Model provides a flexible framework for understanding how individuals develop their sense of self within and in relation to the natural world. The model is valuable as a diagnostic tool and a guide in the creation of place-based activities that support children's play, learning, and growth in nature. The goals of this project were to create an accessible guide to understanding the EID Model and theory; to demonstrate how the EID Model and research may be used in the development of culturally relevant educational strategies; to utilize the EID Model in the creation and curation of effective and flexible PBE activities. Qualitative data from the EID research project were used to explain and contextualize the EID Model. Place-based pedagogies and land education pedagogies were utilized in the development of educational resources. The educational resources created for the website are accessible and flexible, adaptable for diverse ages and environments. The website encourages adults to support "spontaneous" child-initiated activities and explorations in the natural world. Ultimately, this guide is an accessible resource that encourages educators to utilize the EID Model in the pursuit of culturally responsive and child-centered PBE in their own context.

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Applying the Environmental Identity Development Model in Place-based Education: An Online Resource Guide

For my project, I have created a research-informed online resource guide for place-based education (PBE). The guide is informed and framed by the Environmental Identity Development (EID) Model (Green et al., 2016). This guide exists as an expansion and addition to the pre-existing EID Project website (https://sites.google.com/alaska.edu/eidproject/). On this website, I explained and interpreted the current findings of EID research, as well as how these findings may be applied in educational practices. I created an accessible guide to inspire teachers and other adults to pursue culturally responsive and child-centered PBE in their own context. This project served as a capstone to both my coursework and my research experiences in the Masters of People, Place, and Pedagogy Program at the University of Alaska Fairbanks.

Rationale

As humans become more globally and internationally connected, we seem to become less connected to our local place and community (Orr, 2005). Children in particular, in much of the industrialized world, are growing up with less exposure to the natural world and their local community (Clements, 2004). Research has pointed to a multitude of reasons for this growing divide, from increased urbanization to technology to 'stranger danger' (Clements, 2004; Aarts et al., 2010). Following these concerns, there has been a growing movement towards place-based education (PBE) and alternative school options, such as forest preschools. PBE utilizes the resources available in the local environment and community, creating connections between curricular content and the children's lived world (Sobel, 2004). PBE is similar to environmental education (EE), but PBE typically incorporates a wider range of topics and environments, including the human-built world (Woodhouse & Knapp, 2000).

For PBE to gain widespread acceptance and practice, I believe there must be a major disruption to daily life and educational practices. That potential disruption has come in the wake of Covid-19. This pandemic has disrupted and upended lives globally, but within that disruption there is an opportunity for pause and reflection. In the first weeks of the shutdown, as spring weather warmed my Tennessee town, I saw more children and families spending time outside in my neighborhood than I had ever before observed. The disruption to work and school created an opening for families to reconnect with each other and with their environment. If people want to recreate, they must do so outside; if they want to safely socialize, they must do so outside with the people who live near them. We as individuals and as a society should take this time to consider how we can change our lives for the better going forward. I believe reconnecting with our local environment and community should be a priority, and PBE provides an avenue for this goal. However, it is important to note that this environmental disconnect is not experienced by all communities and cultural groups. In these cases, PBE would not necessarily "reconnect" individuals to their local environment and community; rather PBE would do the equally important job of reconnecting education itself with lived reality of its students.

In this project, I intended to create an online resource that translates research theories and findings into practical and engaging place-based educational activities. I have used the knowledge I gained through participation in place-based research studying Environmental Identity Development (EID) in Alaskan children with Dr. Carie Green. The EID Model provides a flexible framework for understanding how individuals develop their sense of self within and in relation to the natural world (Green et al., 2016). The model incorporates both a psychological and sociological perspective of child development. Through our research with young children in Alaska, we have begun to recognize some common patterns of development, as well as

variations related to cultural and individual differences. The EID Model, and the findings from EID research, provide guiding principles for educators. Using the EID Model as a framework and tool, I hoped to create an accessible introduction to place-based practices for educators and adults who wish to implement more immersive and local education with children. The ultimate goal of this project is to provide children the support they need to become informed, confident, and compassionate environmental citizens.

Literature Review

Place-based Education and Environmental Education

In recent decades, researchers, practitioners, and parents have expressed growing concerns that many children are less immersed in the natural world and local community than in generations past (Louv, 2005). Place-based education (PBE) provides a partial antidote to this increasing disconnect, by emphasizing learning in our local environments through lived experiences. PBE takes a holistic, interdisciplinary, immersive, and local approach to teaching concepts, skills, and curricula (Sobel, 2004). A deceptively simple definition of place is "a meaningful location" (Cresswell, 2004, p. 14). By this definition, a location can range from a classroom to a continent. The elements of place will include all the characteristics and processes that imbue that place with meaning, including the landscapes, ecosystems, people, culture, social institutions, built environment etc. Understanding a location as a place enables us to view the world through a lens of connectedness (Cresswell, 2004). We can see that there "is a rich and complicated interplay of people and the environment" (Cresswell, 2004, p. 18).

As children grow older and their awareness of the larger world expands, so does the concept of place, ultimately including international and global connections (Sobel, 2004). PBE shares many commonalities with environmental education, and the terms are used

interchangeably at times. Both fields are immersive, hands-on, and often service-oriented or action-oriented, but EE has the primary focus of instilling and increasing environmental sustainability mindsets and actions (Woodhouse & Knapp, 2000). PBE, on the other hand, incorporates a wider swath of topics and often includes human-built environments and institutions; PBE is concerned with both ecological and cultural sustainability (Woodhouse & Knapp, 2000).

An interdisciplinary approach to education is a core characteristic of PBE (Sobel, 2004; Orr, 2005). Interdisciplinary educational highlights the holistic and interconnected nature of the environment, as well as "the possible unity between personhood, pedagogy, and place" (Orr, 2005, p. 87). Place is always the unifying theme. This approach is exemplified by the EIC-based learning model, or "using the environment as an integrating concept" (State Education and Environment Roundtable, 2013). In other words, the environment is the site and context of learning. The focus on the environment does not exclude other topics; rather, the environment encompasses all other topics. This approach frees PBE (and EE) from the trap of being purely scientific, allowing other modes of comprehension, connection, and expression (Sobel, 2004).

PBE encourages educators to reach out to their unique community resources (Sobel, 2004; Clark, 2008). Place-based pedagogies should value and engender interconnectedness, between school and community, student and policymaker, child and elder. Through these social connections, place-based learning positively impacts civic knowledge and engagement in students (Smith, 2013). Students are empowered to care for their place when they are given the knowledge and tools to do so (Green & Medina-Jerez, 2012).

Civic engagement will not be achieved if child agency is not truly honored in education or projects (Green & Medina-Jerez, 2012). Children of today are unique individuals, creating

change and meaning through interactions with their environment; children possess this agency regardless of whether or not it is recognized (Corsaro, 2017). Acknowledging and honoring this agency is one of the goals of place-based education. Adults must adapt programming and policies to respond to children's needs and agency rather than only training children to adapt to the system (Sobel, 1996; 2004).

While PBE provides a foundation to build a multicultural and decolonizing pedagogy, Western educators must consciously address the insidious influences of racism and colonialism in their educational practices. Increasingly, scholars and practitioners have critiqued the field of EE for the ways in which it perpetuates racist and exclusionary frameworks that characterize the larger U.S. educational system (Tuck et al., 2014). These critiques claim that the cultural perspectives historically framing mainstream EE in the U.S. are Western, White, colonialist, and therefore exclusionary in nature (Lewis & James, 1995; Tuck et al., 2014; Nxumalo & Ross, 2019). This limited way of envisioning nature excludes diverse cultural ways of knowing and understanding nature, which further excludes diverse groups (Lewis & James, 1995; Brayboy & Maughan, 2009; Nxumalo & Ross, 2019). The importance of attracting a greater diversity of educators into environmental fields has long been widely acknowledged (Lewis & James, 1995; Tuck et al., 2014). Additionally, Black, Indigenous, and other scholars and educators have offered alternative pedagogies informed by non-Western ontologies and decolonizing perspectives, such as land education (Brayboy & Maughan, 2009; Tuck, McKenzie, & McCoy, 2014; Mauro & Carroll, 2014; Nxumalo & Ross, 2019), but much work remains to be done in the field. Utilizing place or land as an integrating concept can be a valuable approach to integrating Indigenous and decolonizing perspectives in education (Simms, 2020).

Different theoretical frameworks can facilitate the creation of new pedagogies and educational approaches that center the child and incorporate diverse ways of knowing. The EID Model is one such framework; the model integrates research-informed theories of child development, sociological perspectives of childhood, and environmental educational approaches around the concept of environmental identity (Green et al., 2016). The framework merges a sociocultural overview with individual analyses to understand children's individual growth within the context of their lived environments. This model may be used to inform and guide the creation of child-centered and multicultural educational activities within the context of PBE.

Environmental Identity and Education

Simms (2020) performed a literature review to explore current theoretical influences in the study of environmental identity in educational contexts. The review found Clayton's (2003) definition of environmental identity to be the most commonly used:

> one part of the way in which people form their self-concept: a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the way in which we perceive and act toward the world; a belief that the environment is important to us and an important part of who we are. (p. 45–46)

Environmental identity has most often been studied in adults, and adult environmentalists in particular; there is a need to extend this area of study into children and youth, as well as a more general population (Simms, 2020). In these theoretical frameworks and studies, there is typically "an emphasis on the physical context within which environmental identities develop as opposed to the social context" (Simms, 2020). The EID Model (Green et al., 2016) provides an

important theoretical framework in this field as it integrates the importance of the physical environment and the influence of sociocultural contexts (Simms, 2020).

Studies of environmental identity in education often occur within the science classroom (Tugurian & Carrier, 2017; Simms & Shanahan, 2019; Simms, 2020). Children as young as 10 and 11 can recognize and describe their own environmental identity, but this identity is "often unacknowledged in the science classroom," forgoing a valuable opportunity of creating experiential, cognitive, and affective connections between students and scientific concepts (Tugurian & Carrier, 2017, p. 143). Simms and Shanahan (2019) recommend incorporating and supporting reflective activities in science classrooms and curricula; they describe self-reflection as a productive practice in identity. A variety of reflective practices (i.e. journaling, group discussions, etc.) encourage children to relate school materials and experiences to their personal feelings, beliefs, actions, and inquiries. Educators play an important role in facilitating and listening to student reflections, assessing where children require support and guidance in their environmental identity development (Simms & Shanahan, 2019). Our research methods in the EID Project utilize reflective activities in the form of classroom discussion and bookmaking with children, to foster deeper understandings of children's relations with their environment.

Miao and Cagle (2020) studied how a variety of social identities interact with environment identity in undergraduate students of diverse backgrounds. They found that gender identity, racial/ethnic identity, and socioeconomic status all played important and complex roles in environmental identity development. For example, students felt that gender stereotypes and expectations restricted their ability to connect and interact with natural world as children; some women felt as though they were expected to stay inside as girls, whereas young men said they were mocked or discouraged from interests in 'feminine' aspects of nature, such as flowers.

Racial minorities and underrepresented gender groups said they had fewer mentors or teachers of a similar identity, and this affected their ability to visualize a relationship and role with the natural world as children. These findings provide important insights into the complexities of EID across culture, as well as the need for greater empathy, inclusivity, and representation in educational approaches to support EID.

The EID Model

Although research has explored the influences and effects of environmental identity, very little literature exists to theorize the process by which this environmental identity develops (Green et al., 2016). The EID Model provides a framework to understand and analyze "the progression of young children's self-cognitions in relation to the natural world" (Green et al., 2016, p. 1025). The EID Model arose from dialog concerning child development and its relation to early childhood environmental education (ECEE) and early childhood education for sustainability (ECEfS) (Green et al., 2016). The goal of this type of education is to instill a sense of environmental citizenship and encourage pro-environmental behaviors in children from a young age. The EID Model bridges sociological and psychological theories of childhood in the context of environmental identity.

Sociological research on children and childhood has experienced a resurgence in the past 30 years (Corsaro, 2017). This renewed interest is due largely to a shift in the sociological perspective on childhood: the recognition of children as social actors and agents of change (Prout & James, 1997). This shift in understanding has been mirrored by changing research methods that include children as active participants or co-researchers to a greater degree (Green, 2015). Recognizing child autonomy and agency is an essential component of the EID Model and EID-framed research.

Green et al. (2016) based the EID Model off of Erik Erikson's theory of psychosocial development (Erikson, 1950; 1972; 1980). Erikson's theory has been an important influence in modern theories concerning environmental identity (Simms, 2020). Although Erikson's theory is a psychological model, it "recognizes the inherent autonomy of children at a very young age in constructing their own meaning of the world," and is therefore compatible with contemporary sociological theories of childhood (Green et al., 2016, p. 1027). Green et al. (2016) recontextualized Erikson's four stages of development within the natural world. A positive identity develops when a child effectively "overcomes the foundational dilemmas presented at each stage" (Green, 2016, p. 1027).

The four major tensions of the EID Model are: *Trust in Nature* vs. *Mistrust in Nature*, *Spatial Autonomy* vs. *Environmental Shame*, *Environmental Competency* vs, *Environmental Disdain*, *Environmental Action* vs. *Environmental Harm* (See Figure 1 below). The child navigates both inner and outer tensions in this progression. Their experiences are framed by familial, cultural, and societal values, but their progression is determined by personal feelings and actions. This progression is also situated within learning experiences that inform and influence the child. The EID Model borrows from Lucas's (1979) environmental education model; the four tensions of EID are contextualized in education *in/from* the environment, *about* the environment, and *for* the environment. The EID Model is not strictly linear, but rather, it recognizes four major tensions through which children will progress as they navigate their relationship with the natural world (Green, 2018a). These navigations and tensions will continue into adulthood and throughout life for all of us. Ultimately, a strong and positive environmental identity will be associated with pro-environmental attitudes and behaviors.

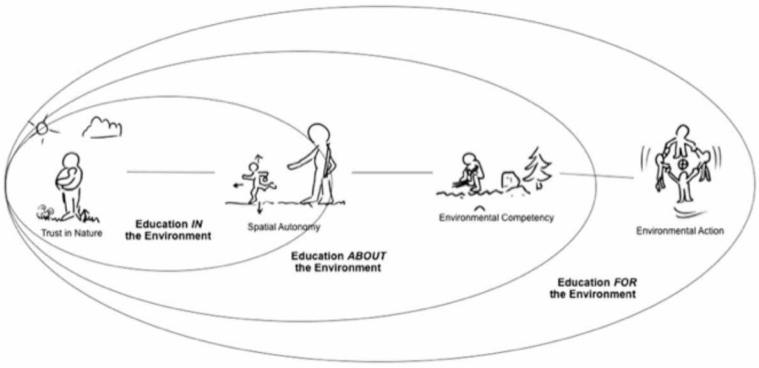

Figure 1. Model of Environmental Identity Development © Carie Green.

Environmental identity, and related theories of ecological identity and place identity, have largely been studied in adult populations, whereas studies on children (young children in particular) have been limited (Green, et al., 2016). I have participated in one of the few current projects studying children's EID with Dr. Carie Green. She is carrying out an ongoing longitudinal study on the EID of young children in Alaska in varied geographic and sociocultural contexts (Green, 2017; 2018; 2020). A possible critique of the EID Model is that it is formed within a Western worldview, especially with its emphasis on the individual, and therefore cannot be applied in diverse cultural contexts (Green, et al., 2016). Indeed, simple and non-reflexive application of the EID Model in different cultural frameworks it not enough, nor is that its intended use. It is essential for educators and other adults to practice constant reflexivity and cultural responsiveness when using the EID Model. With this sociocultural focus, the EID Model has been a valuable lens in detecting and analyzing the unique ways in which individuals of both Western and Indigenous cultures operate within and experience the world (Green, 2017; Green & Lliaban, 2020; Lunda & Green, 2020). Properly applied, the EID Model can be a valuable tool in the creation of culturally responsive and child-centered PBE.

My goals with the expansion and creation of educational resources on the EID Project website included:

- To create a clear guide to understanding the EID Model and theory, one which will be useful to educators, parents, and practitioners.
- To identify data and findings from the EID Project research that exemplify effective place-based and child-centered educational methods and strategies.
- To demonstrate the how the EID Model and research may be used in the creation of culturally relevant educational activities and methods.
- To utilize the EID Model in the creation and curation of effective and flexible place-based educational activities.
- To inspire educators to use the EID Model in the pursuit of culturally responsive and child-centered PBE in their own context.

Theoretical Perspectives

My work is framed and informed by the Environmental Identity Development Model (Green et al., 2016). The Model is not strictly linear but provides a broad framework for understanding the inner and outer tensions children negotiate through micro-interactions as they develop their environmental identity. The Model allows me to understand and analyze the process by which children develop *trust in nature*, *spatial autonomy*, and *environmental competencies*, and ultimately commit to *environmental action*. My curriculum project is also grounded in a theoretical framework acknowledging and honoring children's agency (Prout & James, 1997). In the development of educational approaches, I am working with place-based pedagogies (Sobel, 2004) and post-colonial and decolonizing land education pedagogies (Tuck et al., 2014). Furthermore, I am guided by the four educational strategies established as goals in Dr. Carie Green's EID research: promoting children's self-regulation in nature, developing

children's empathy in nature, promoting nature connectedness, and developing cultural connections to environment and place.

Methods: Design of Project

My online guide exists as a new branch on the pre-existing EID Project website (https://sites.google.com/alaska.edu/eidproject/) created using Google Sites Web page creation tool. The website was created to educate the public about the EID Model and to share the data and findings from Dr. Carie Green's NSF-funded research project: *CAREER: A longitudinal study of the emotional and behavioral processes of Environmental Identity Development among rural and non-rural Alaskan children* (Award # 1753399). The website is accessible to the general public, and searchable via online search engines. I developed and expanded upon the education branch on the website. My aim was to make the website accessible, intuitive, and visually appealing. All photos uploaded onto the website, whether for informational or aesthetic purposes, were sourced from the research data or from pictures I have taken.

In the creation of this information guide and the development of educational approaches, I worked with the research data collected from the *CAREER* study from 2018-2019. This data was used to contextualize and clarify research findings and educational approaches. The data include video from wearable cameras and iPads, photographs, child-drawn pictures, and transcripts from video-recall discussions with children. All children were assigned pseudonyms. Raw video data were edited into smaller clips and subtitled via Microsoft iMovie editing software. The videos were uploaded to YouTube and published as "unlisted" addresses, so they may only be found and watched through the EID website.

My work on the website first expanded upon the pre-existing *Education Initiatives* webpage and its nested pages. These webpages demonstrate and showcase education initiatives

and activities that were implemented or observed with the research cohorts. These educational strategies are grouped according to four themes: promoting children's self-regulation in nature, developing children's empathy in nature, promoting nature connectedness, and developing cultural connections to environment and place. The lessons and activities were developed in conjunction with classroom teachers, to respond the observed needs and interests of the two cohorts during their nature outings. These webpages were created by a former graduate student, but they did not yet include data and findings from all research cohorts. I identified more moments and events from the research data that depict the responsive educational strategies in context. Video or other forms of data were included as befits the context.

Next, I created a new *Resources for Educators* section on the website. On this page, the linkage between the EID Model and PBE is clarified, as well as the importance of culturally relevant education within the EID Model and PBE. A link on this page directs users to a new section, *Understanding the EID Model*; this page includes an introduction and explanation of the EID Model, providing greater detail about its background and theoretical influences. *Understanding the EID Model* provides a guide to the four progressions of the EID Model with a series of video vignettes. These vignettes include instances identified in the research video data that demonstrate children navigating the various tensions within the EID Model. The significance of these vignettes is explained, as well as potential educational approaches. Educators and practitioners are encouraged to use the lens of EID to gauge their own children's abilities and comfort in the natural world, as well as to determine how to support them in their continuing development.

In the *Resources for Educators* section, I created and shared various EID-informed PBE strategies and methods. These strategies and methods were designed to be flexible and widely

applicable, providing adaptations or supplemental activities for different ages and contexts. In their descriptions, these activities are related to the EID Model and the four learning strategies outlined in *Education Initiatives*. To display a wider variety of lesson plans and teaching methods, I contacted former students of ED 681 Placed-Based Education taught by Dr. Carie Green at UAF to request that they share their EID-inspired lesson plans and projects created for the class (see Appendix A for emailed consent of former students). I also contacted educators from outside UAF to see if they have original activities they could contribute to the project (see Appendix A for emailed consent). The lesson plans were incorporated or built upon according to different topics and themes. In addition to facilitated activities and lessons, there is a section on the importance of unstructured play and exploration in the natural world; the environment as teacher is an important component in the EID framework.

Ethical Considerations

For this project, I did not develop new research, nor did I collect new data. I created educational resources using data previously collected from the *CAREER: A longitudinal study of the emotional and behavioral processes of Environmental Identity Development among rural and non-rural Alaskan children (NSF Award # 1753399)*. This project received IRB approval from UAF (IRB #1203291), and all data was collected with both adult written consent and child verbal assent, with the understanding that images and videos may be used for educational purposes. The data included video from wearable cameras and iPads, photographs, child-drawn pictures, and transcripts from video-recall discussions with children. I worked with Dr. Carie Green to determine what pictures or videos could be made available on the site without impinging upon the anonymity of the research participants. All children were assigned pseudonyms. As I worked with this research data, I recognized that research with children

involves navigation of entrenched power dynamics, not only between subject and researcher, but between child and adult (Fargas-Malet et al., 2010). Involving the children as participants and co-researchers, as these research methods do, can empower the children and strengthen the authenticity of research findings (Fargas-Malet et al., 2010). However, I maintained a position of reflexivity, placing children's words and experiences first and acknowledging when interpretations are my own.

Application for the Field

For the EID Project website, I expanded upon the *Education Initiatives* pages, and I developed a new *Resources for Educators* section. At the time this project was written, these webpages have yet to be fully tested or receive feedback from the public. The application of the website will continue beyond the completion of my graduate degree.

I have listed the webpages I altered or created and their links below:

- *Education Initiatives* https://sites.google.com/alaska.edu/eidproject/project-overview/education-initiatives
    - *Promoting children's self-regulation in nature* https://sites.google.com/alaska.edu/eidproject/project-overview/education-initiatives/promoting-childrens-self-regulation-in-nature
    - *Developing children's empathy with nature* https://sites.google.com/alaska.edu/eidproject/project-overview/education-initiatives/developing-childrens-empathy-with-nature
    - *Promoting nature connectedness* https://sites.google.com/alaska.edu/eidproject/project-overview/education-initiatives/promoting-nature-connectedness

    - *Cultural connections to the environment and place* https://sites.google.com/alaska.edu/eidproject/project-overview/education-initiatives/cultural-connections-to-the-environment-and-place

- *Resources for Educators* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators
    - *Understanding the EID Model* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/understanding-the-eid-model
    - *Nurturing EID through Place-Based Activities* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods
        - *Nature Journaling* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods/nature-journaling
        - *Scavenger Hunts* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods/scavenger-hunts
        - *Tracking the Seasons* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods/tracking-the-seasons
        - *Art in Nature* https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods/art-in-nature-art-from-nature

        - *Developing Cultural Connections to Place*
          https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/place-based-education-methods/developing-cultural-connections-to-place
    - *Spontaneous Child-Initiated EID*
      https://sites.google.com/alaska.edu/eidproject/project-overview/resources-for-educators/spontaneous-child-initiated-eid

Expanding upon the "Education Initiatives" Webpage

The *Education Initiatives* webpage lists and describes the four themes that guide the research project's educational strategies: promoting children's self-regulation in nature, developing children's empathy in nature, promoting nature connectedness, developing cultural connections to environment and place. Each theme has its own nested webpage (see Appendices B.1-B.4 for my additions to these webpages). On each of these webpages, there are examples of how the pertinent educational strategy manifests in context with our research cohorts, with video clips, pictures, descriptions, and other data collected over the course of research. When I began this project with the rural and non-rural cohorts in our research, only examples from the non-rural cohort had been curated and posted on these webpages. I went through the video data from our rural cohort, identified these thematic learning strategies from events within the data, and edited the moments into shorter, subtitled clips. These videos and other relevant data were posted onto the themed webpages, along with descriptions and explanations as to their significance to the educational themes. These pages were generally reformatted to make the information clearer and the aesthetics cleaner.

It was sometimes difficult to fully separate each educational event into a disparate category; often, I could discern multiple educational strategies in effect during one educational event. Therefore, the same events are sometimes repeated in different categories. I describe the different ways in which the events apply to each thematic category. This method was keeping in style with the procedure applied previously with the non-rural cohort sections on these pages.

Building New "Resources for Educators"

On the main *Resources for Educators* webpage, I provide a rationale for the linkage between EID and PBE, and I explain the importance and relationship of culturally relevant education to EID (see Appendix C). There are also three new resource sections: *Understanding the EID Model*, *Place-Based Educational Activities*, and "*Spontaneous" Child-Initiated EID*.

The *Understanding the EID Model* webpage provides a general description of the EID Model, with greater detail nested in sections below (see Appendix D). These sections are collapsible to account for the large amount of information contained within them. Included below the description and history of the EID Model is a section that guides the reader through the four EID progressions. This guide utilizes video vignettes from the research data, showing examples of children navigating the four progressions. The examples are from both the rural and non-rural cohorts, showing children's experiences in diverse environments and situations. Many of these moments had been identified and analyzed previously in discussions with Dr. Carie Green. Two movies were developed for each of the four progressions for a total of eight vignettes.

These video vignettes were created from the wearable camera video data, and so they provide the perspective of the child as they navigate different tensions and challenges in the natural world. The videos provide adults with insight into the seriousness, difficulties,

challenges, successes, joys and excitements associated with children's outdoor interactions. For each vignette, I describe the events in the movie, and I explain how they relate to the child's EID and the four progressions. Sometimes the vignettes show a child facing a challenge, while other movies depict a child's ease interacting with the natural world. For each example, there are suggestions for possible for possible interventions to strengthen or support a healthy EID, where applicable.

The *Nurturing EID through Place-Based Activities* webpage explains how to use the listed educational activities to support and strengthen EID in both children and adults (see Appendix E.1). There are links to five educational themes and activities: *Nature Journaling*, *Scavenger Hunts*, *Tracking the Seasons*, *Art in Nature*, and *Developing Cultural Connections to Place* (see Appendices E.2-E.6 respectively). Every page describes the relevant activity and provides a Google Drive link to download a PDF version of the webpage's materials. The activities in *Nature Journaling*, *Art in Nature*, and *Developing Cultural Connections to Place* were either inspired or supported by the work of UAF graduate students and outside educators who consented to sharing their activities and lesson plans. The original authors are credited for their contributions on the website. More graduate students responded and shared their work late in the process of project development, and I was not able to include their work due to time constraints. Although I have more ideas for educational activities, I had to limit the scope and size of the work for this Masters' project. Fortunately, this website is a living document that will continue with myself and the EID Project research team. I hope to adapt and include these lesson plans in the future.

The website educational methods and strategies were designed to be highly flexible and applicable across contexts. They may be used by educators or other adults, in the classroom or at

home. There are suggestions provided on how to adjust each technique for different age groups and contexts. Educators are encouraged to take advantage of the highly flexible nature of these activities and adapt them to their particular cultural context.

The "*Spontaneous" Child-Initiated EID* webpage presents children's self-initiated play and exploratory behavior in the natural world as important and influential interactions for their EID (See Appendix F). The word "spontaneous" is used to describe these activities, because they occur without planning on the part of the adult or child. They are spurred by a child's interests, social interactions, and the environment itself. Research literature is included to provide greater insight into on nature play and these references are included on the webpage.

Examples of these "spontaneous" activities fall into three categories: climbing in nature, imaginative play, and playing with sticks. These examples are presented as a collection of video vignettes identified from the research data. These videos are largely from the perspective of the children, via wearable cameras. A total of twelve videos are on this webpage. For each video, I describe its significance in terms of the child's experiences in nature and their EID. Teachers and other adults are encouraged to provide children with ample opportunities to have these "spontaneous" experiences. Adults can support these activities by providing ample time and space to children as they explore the outdoors, observing from their activities from a distance and only participating as necessary or as invited.

Possible Future Applications of the Website

This project has broad applications for the field. This website will be freely available online, and I will work with Dr. Carie Green to determine appropriate places to advertise or link the site. Different possible organizations and institutions with which to share it include the North American Association of Environmental Education, the Forest Service, and the National Park

Service. The website may also be found by individuals via Internet search engines. I will be able to see the visitor count and traffic on the site with Google Site's tools. Technically, application of the website will largely be carried out by educators and other adults, so it is difficult to describe or visualize the applications in all their forms. The goal is for educators and parents to adapt and use the information and resources on this website for their own educational purposes and needs. The website resources can be easily adapted to various contexts. My contact information along with Dr. Carie Green's is on the website, so people may contact us with questions, suggestions, or feedback as they utilize the website.

I will have an opportunity to present the website to educators and students in the next year. Dr. Carie Green has invited me to be a presenter at a PBE course she is teaching in Spring 2021. I will continue to look for more opportunities to share the website with educators. It is my hope that those that find and apply these educational resources are well-informed and empowered to support children's growth in their environmental identity development.

Final Reflection

For this graduate project, I created a guide to understanding and applying the EID Model in educational contexts. I curated and developed a collection of place-based activities for educators and other adults to implement in their own environment and context. I believe that I have achieved the goals I set out for this website, although the final product took a different shape than I had initially visualized. I learned a great deal, both personally and professionally through this process.

Learning through the Process

Creating these webpages and educational resources enabled me to focus my research, writing, and creativity in a way that expanded and deepened my understanding of the EID Model

and its applications. While I understood the EID Model previously, I gained new insights and perspectives as I developed the educational content for this website. I made new connections and interpretations within the research findings and the research literature. As I worked to strengthen my understanding of this research, I found new fascinating papers and connected with researchers in this field who were extremely helpful and encouraging. I came to appreciate the value of learning and connecting through creating.

Translating Theory into Practice

In this project, I hoped to translate theory into practice, making these scholarly concepts accessible for more general audiences. I tried to strike a balance between the academic and the approachable, and I'm not certain I always found that balance. I believe that my writing on the website more often leans towards the scholarly than not. To account for this, I attempted to make introductions and general explanations as accessible as possible. Those individuals interested in learning about these concepts in greater depth then have the option of engaging with the more academic material in separate sections.

Through this process, I learned about some of the challenges and complexities of turning research theories and findings into policies and practice. How do you simplify a complex concept without relinquishing the important subtleties and nuances? I attempted to respond to this challenge by separating complex concepts into digestible parts, rather than oversimplifying them. There was some inevitable simplification throughout this process, but a concept like the EID Model cannot be fully grasped on paper (or a screen) anyway. It must be utilized in practice and context. Therefore, I must remember that I cannot fully translate this theory into practice via this online resource. Rather, I am providing the means for others to use the EID Model in their own context.

Determining and Managing the Scope of the Project

The end result of this website is quite different from the product I envisioned and wrote about in my project proposal. Initially, I imagined I would be producing my own separate website, but instead, I developed the educational branch of the EID Project website. This was a beneficial change, as there was a formatted website in place already with certain webpages partially developed. Nevertheless, it did require a reworking of my design plans to adapt to the format, organization, and style of the website.

Originally, I had also planned to have a greater number of resources in different topics and areas. As time went on, I realized that my plans for the website were perhaps beyond the scope of what I could and should accomplish over the course of this graduate project. I had to simplify, shorten, or relinquish certain sections. Overall, this methodical curation allowed the webpages to be more unified and straightforward. However, there are still topics, such as critical culturally relevant education, I wish I could have expanded upon. Fortunately, the EID project research team and myself can continue to build upon this website beyond the completion of my graduate degree.

Conclusion

The EID Model provides a valuable framework for educators and other adults to understand the process through which children develop their environmental identity. Through this graduate project, I demonstrated how the EID Model may be used both as a diagnostic tool and a guide in the creation of place-based activities. I explained how the EID Model, applied in research contexts, has deepened our understanding of the complex processes by which children build a relationship with the natural world.

The website is an interactive and intuitive platform, on which researchers, educators, and other adults can discover resources to better understand and apply the EID Model and research findings in various contexts. The educational resources on the EID Project website are accessible and flexible, adaptable for diverse ages and environments. Educators are encouraged to recognize and honor diverse and different cultural ways of relating to the natural world. In applying the EID theory into practice, it is important for adults to play a more supportive role than an intervening role in encouraging children's spontaneous exploratory and play behaviors in the natural world.

This work served as a capstone project to both my research experience as a graduate assistant and my course work as a student over the last year and a half. This project has facilitated the synergistic integration of all the knowledge, skills, and experiences I have acquired in my time in the M.Ed. People, Place, and Pedagogy Program. I hope the resources on this website inspire educators to use the EID model in the pursuit of culturally responsive and child-centered PBE in their own context.

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Appendix A

Emailed Consent of Former Students and Educators

Maggie Blake <mrblake2@alaska.edu> Sun, Oct 11, 4:44 PM

to Emmett, kgieser, erheslop, jsandifer, Kate, rmschmidt4, Carie

Hello former classmates,

I hope this email finds you well!

I'm writing to request use of your EID-informed projects, created during ED 681, for my Masters project. The goal of my Masters project is to create an online place-based education resource guide informed by EID research.

As many of you know, for the last year I worked as a graduate assistant to Dr. Carie Green on her project studying environmental identity development in Alaskan children (NSF-funded research project, Award # 1753399, *CAREER: A longitudinal study of the emotional and behavioral processes of Environmental Identity Development among rural and non-rural Alaskan children*.) For my project, I am currently developing the education portion on the EID project website (https://sites.google.com/alaska.edu/eidproject/project-overview).

I was impressed by the thoughtful and creative work produced by all of you throughout our class together. With your permission, your work will be published on the EID project website to show effective and innovative approaches for teaching EID. Your projects will demonstrate the diverse possible applications of EID for educators and practitioners.

If you consent to share your work, your work may be edited and adapted for online publication and use. I will connect your lesson plans with EID materials and themes on the website, and organize them according to theme and topic. The website and its contents will be made freely available to the public. Also note, your adapted work will be published through UAF as part of my final project paper.

I am specifically requesting use of your Place-Based Lesson Plan, but if you utilized the EID model in your final project or other assignments, you are encouraged to provide those works as well.

If you consent to sharing your work, please respond in an email stating that you consent and with the attached projects you intend to share.

If you would like to share your project, please respond **by Friday Oct. 23**. Let me know if you have any questions!

Thank you,

Maggie Blake

Emmett Foster Tue, Oct 20, 5:51 PM

to me

Hey Maggie,

Here is my ecological lesson from PBE! Feel free to make any needed changes!
I hope life is groovy! Are you graduating this December? Stoked for you!

Cheers,
Emmett

Emma Heslop Wed, Oct 14, 9:39 AM

to me

Hi Maggie!

I consent to you using any of my work for this project.

Hope things are going well! When do you graduate?

Emma

•••

Kristine E. Rosevear Sun, Oct 25, 3:46 PM

to Carie, me

Maggie has my consent to use my work.

Sent from my iPhone

> On Oct 25, 2020, at 12:36 PM, Maggie Blake <mrblake2@alaska.edu> wrote:
>
> •••

Jack Henry <panamajack82@icloud.com> Mon, Oct 26, 7:44 AM

to me, Carie

Hello Maggie,

Here is my project. Please feel free to share.

John Henry

Shannon T Mon, Nov 2, 4:17 PM (7 days ago)
to me

Maggie,
Here is my final ED681 project. Hopefully this helps.

Shannon Trizzino

Rosalie Haizlett Fri, Oct 30, 9:32 AM (10 days ago)
to me

Hi Maggie,

Thanks for getting in touch about this! I'd be happy to give you permission to include my nature journaling exercise in your project. I've attached photos that people sent me of their version of the project. IMG_5521 and "my_palette.jpg" are the graphics I created to announce the "Winter Color Challenge."

Here were my instructions:

I've found that making color palettes has been a fun tool to help me be more observant on hikes. I hope you'll take a few minutes to try it out!

Step 01. Bust out some colorful drawing or painting tools (pastels, colored pencils, watercolors... heck, even crayons will do the job!).

Step 02. Take a hike/stroll through the woods, a park (or even your backyard). On your walk, pay extra attention to the forest floor to look for colorful natural items like mossy sticks, stones, or fallen leaves. Collect a few items that have colors that you like, taking care not to pick any living plants. IMPORTANT: If you are in a park or nature preserve, make sure to practice "Leave No Trace" ethics (https://lnt.org/learn/7-principles) and simply take pictures of the colorful items instead of collecting or disturbing anything.

Step 03. Return home and lay out the things you collected on a table or get out the photos that you took on your hike. Choose a few colors that you like from the inspiration you've collected and use your art materials to try to replicate the colors of the items onto your paper. Write the location of your hike on the paper too!

You can link to my website at rosaliehaizlett.com.

Good luck with your project!
Rosalie

Appendix B.1

Additions to *Promoting Children's Self-Regulation in Nature* webpage

Cohort 2: Rural Children

Fall 2019

Safety at the Beach. For the first outing of Fall 2019, the children visited the beach near their school. It was a windy day, and sizable waves were crashing on the shore. Some children approached the water, and one even climbed onto a driftwood log that was being battered by waves. We facilitated a reflective question and discussion about safety, to encourage children to think about and share safe behaviors. Afterwards, the children's bicultural teacher incorporated the topic of ocean safety into a language lesson.

The Ocean- How can we be safe at the beach?

Anne - "Not hit people with sticks."

Philip - "Gun. Swimming."

Owen - "Stay away from the water."

Oliver - "I don't know."

Samuel - "Be at my house." Researcher - Can you go by yourself? "No."

Jackson - "Lost the sticks in the water."

Emma - "I always run away from the water when I try to look for little fish."

Patrick - "We can go home."

Sally - "Run away from the waves."

David - "I like to play at the playground by the beach." "Don't go by myself."

Chloe - "Water." "Choo choo train."

Erin - "Do not go in the water!"

Grace - "When my dad comes to get me and we go home. Have cocoa and marshmallows."

Steven - "Throwing sticks at the waves."

Ocean Safety in Iñupiaq. The bicultural teacher continued the ocean safety discussion in her lesson. She taught the Inupiaq terms for different ocean conditions, either smooth or rough. She encouraged the children to use their own observation skills to read and understand the ocean.

Appendix B.2

Additions to *Developing Children's Empathy with Nature* webpage

Cohort 2: Rural Children

Fall 2019

Sharing on the Tundra. The children's bicultural teacher accompanied them on their field trip to the tundra. The teacher showed the children the different berries, where to find them, and how to pick them. As children gain environmental competency, they will learn to appreciate and respect the land for the sustenance it provides them. Importantly, the teacher also demonstrated the value of actively sharing berries with others. This value of sharing is deeply important in Iñupiaq culture, as a practice of respect and reciprocity. Reciprocity is practiced both with the human and non-human world, and so this act of sharing with others is an extension of an ethic that emphasizes empathy for all living things.

Appendix B.3

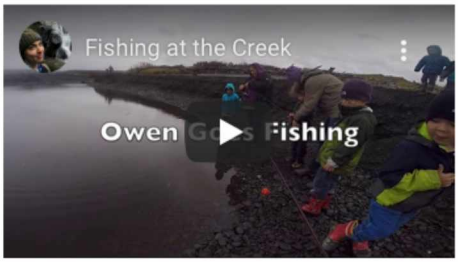
Additions to *Promoting Nature Connectedness* webpage

Cohort 2: Rural Children

Fall 2019

Picking Berries on the Tundra. The children's bicultural teacher accompanied them on their field trip to the tundra. The teacher showed the children the different berries, where to find them, and how to pick them. Finding one's food in the natural world is a highly personal and meaningful interaction. Through the development of these environmental competencies, the children will deepen their connection to nature.

Fishing at the Creek. On a field trip to Pebble Creek, teachers and parents brought child-size fishing rods and bait. Some children with prior fishing experience demonstrated great skill in casting and reeling their lines, while others benefited from more assistance and support. Adults provided children with basic knowledge of casting and then allowed them space to develop these competencies through trial and error. Children experienced the challenge of casting the line and then the joy of a successful cast.



Appendix B.4

Additions to *Cultural Connections to the Environment and Place* webpage

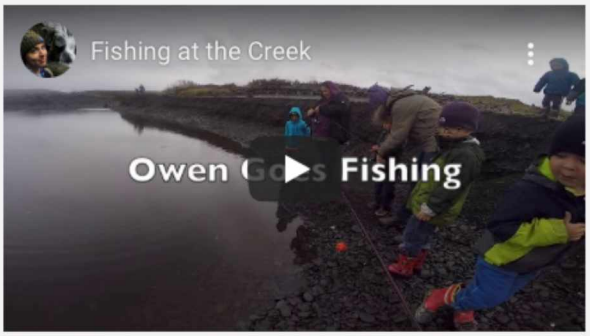
Cohort 2: Rural Children

Fall 2019

Ocean Safety in Iñupiaq. The bi-cultural teacher talked to the students about ocean safety in the context of Iñupiaq language and knowledge. She encouraged the children to use their own observation skills to read and understand the ocean.

Subsistence in the Village. Subsistence practices are an essential part of Iñupiaq culture and rural life. With teacher and parent support, the children practiced subsistence activities on two outings, first berry-picking on the tundra and then fishing at a creek. Adults also encouraged traditional ways of learning; such as learning through observation and learning-by-doing.

Berry-Picking



Fishing

Appendix C

Resources for Educators Webpage

How can educators use the EID model?

The EID model has diverse applications across educational contexts.

When a young child collects leaves, sticks, rocks, and dirt, stirring a bowl to create mud pies, they are developing their environmental identity.

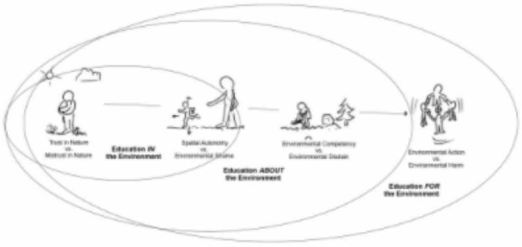
When child visits a small pond for days, to watch as tadpoles lose their tails and grow into frogs, they are developing their environmental identity.

When a teenager notices a lack of recycling bins at school and decides to organize a recycling drive, they are developing their environmental identity.

The EID model provides a guide to understanding how we build a relationship with the natural world. This process may be life-long and is unique to every individual. Developing one's environmental identity is as simple as going outside, but it does not end at going outside. Educators and caretakers can support a healthy EID by providing children with developmentally appropriate activities and lessons. **Understanding the EID model** allows caretakers to understand where children are in their development and how to support them going forward.

We recommend using the EID model in conjunction with **place-based education**. Place-based education (PBE) is a holistic, interdisciplinary approach to education. The local environment and community are the primary site and source of learning. It's important to integrate both the EID model and PBE with **multicultural approaches** and frameworks. Continue reading to learn more and find recommended education strategies below.

Learn more about the EID Model



EID & Place-Based Education

Place-based education (PBE) takes a holistic, interdisciplinary, immersive, and local approach to teaching concepts, skills, and curricula (Sobel, 2004).

A deceptively simple definition of place is "a meaningful location" (Cresswell, 2004, p. 14). By this definition, a location can range from a kitchen to a continent. The elements of place will include all the characteristics and processes that imbue that place with meaning, including the landscapes, ecosystems, people, culture, social institutions, built environment etc. Understanding a location as a place enables us to view the world through a lens of connectedness (Cresswell, 2004). We can see that there "is a rich and complicated interplay of people and the environment" (p. 18).

Education based in place becomes meaningful, relevant, and connected to students' lives. Through PBE, the local environment and community become the primary source and site of learning. The scale of place will change and grow as children develop (Sobel, 2004). For young children, the house, front yard, school building, and local park may be the primary places of learning and discovery. Much of this learning will occur through direct interaction and exploration. As children grow older and their awareness of the larger world expands, so does the concept of place, ultimately including international and global connections (Sobel, 2004).

We see a similar progression through the EID Model. For very young children, or individuals developing a basic trust in nature, direct interactions and experiences in nature are crucial. As individuals progress through their EID, they will develop greater spatial autonomy, enabling them to explore more widely and independently. Eventually, individuals will develop environmental competencies and knowledge; many of these skills may be learned in and from the natural world, but individuals may require supplemental education from books, teachers, scientists, and community members. Finally, a healthy environmental identity will result in environmental action and advocacy. This action may takes place at the local scale or at regional and global scales, as people engage with the global environmental issues and challenges of the modern world. The actions actions can also incorporate causes of environmental justice.

The EID Model model also recognizes that our environmental identities are complex and unique. Environmental identity is influenced by past experiences and emotional attachments, as well as familial, cultural, and social values (Clayton, 2003). PBE provides a holistic approach that allows and encourages connections with these various elements of identity.

EID and Multicultural Education

The EID Model emphasizes the importance of family, culture, and society in the development of one's environmental identity. It is essential for educators to consider cultural identity when developing educational or recreational activities to promote EID.

There is no one method or technique that can be recommended to capture the diversity of ways in which different cultures understand and interact with the natural world. Instead, it is vital that educators and caretakers acknowledge and learn about the different or diverse cultural backgrounds of their students and children. This may be done by reading and researching about other cultures, but more importantly educators must respectfully observe, listen to, and ask questions of the communities and children they serve.

Educators must also recognize and incorporate diverse cultural ways of learning and teaching. These different ways of learning may not be apparent at first to a cultural outsider. For example, in our research with Alaskan children in rural and non-rural contexts, we've begun to notice differences in the two groups' level of awareness and observation in the natural world. On our class nature tours, the children are equipped with wearable cameras as they explore and play, so we may learn more about their experiences in nature. However, after several hours of watching the video data from the rural cohort of the Alaska Native village, we realized we were often learning a great deal more about the children *not* wearing the camera than the ones wearing it. It seemed the children were quietly and highly observant of others around them, and these observations were captured with their wearable cameras. Learning through observation is indeed an important value in Alaska Native cultures (Barnhardt & Kawagley, 2005), but this learning style may be difficult for a cultural outsider to perceive initially.

Identities related to culture, such race, ethnicity, gender, and socio-economic status, may also affect individuals' environmental identity development (Miao & Cagle, 2020). Consider, has this individual seen mentors or role models who look like them in environmental fields? Have they had opportunities while growing up to visit or vacation in natural areas? Generally speaking, are natural spaces and recreational activities accessible and welcoming to their gender or race identity? It's important to ask these questions so that we may create effective and empathetic educational experiences for all in the natural world (Miao & Cagle, 2020).

Educational Methods and Strategies for Nurturing EID

We have created and curated various educational methods that support and nurture EID. In the creation of these education strategies, we drew from the EID model, place-based pedagogies, and our research-informed education initiatives. We also worked in collaboration with graduate students in M. Ed. programs at the University of Alaska Fairbanks to develop a greater diversity of activities.

These methods and strategies may be used by educators or caretakers, in the classroom or at home. Many of these learning activities are applicable to people of all ages. We provide suggestions on how to adapt each technique to different age groups and contexts. These educational methods are intended to be flexible and responsive to the needs of your learners, and you should adapt or modify them as necessary.

It is important to remember that these activities only provide opportunities for environmental identity development. It is the individual's emotions and interactions within and for the environment that will drive their personal development. With that in mind, we have included a section on "spontaneous" child-initiated learning activities. In our research, we have seen children engage in these activities over and over again across cultures and contexts. We provide suggestions on how to support these "naturally occurring" EID activities in children.

Place-Based Education Methods

In this section, we provide a collection of education methods that are informed by place-based pedagogies. These methods may be used to support and nurture various aspects of one's environmental identity. The activities are organized according to 5 general themes or topics:

- Nature Journaling
- Tracking the Seasons
- Scavenger Hunts
- Art in Nature, Art from nature
- Cultural Connections to Place

Spontaneous Child-Initiated EID Activities

In this section, we explore 3 outdoor activities children engage in across cultures and contexts:

- Playing with sticks
- Dramatic Play
- Climbing in Nature

These activities may seem commonplace from viewpoint of adults bystanders, but they can have great influence and meaning in a child's EID. With examples from our research, we provide insight into the challenges, triumphs, and growth children experience during these activities.

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Appendix D

Understanding the EID Model Webpage

The EID Model is **fluid**, **flexible**, and **child-centered**.

The EID model provides a framework for understanding the process through which a child develops their **environmental identity**. It is not and should not be used as a strict linear formula of development. A strong environmental identity will be associated with positive environmental attitudes and behavior. A weak or negative environmental identity will result in intentional or unintentional environmental harm. Sociocultural, geographical, and educational contexts influence the way in which a child's environmental identity is formed. This model was designed in the context of early childhood education, as a tool for caretakers and educators to better understand and support children's EID, but the process of EID development may be lifelong.

As seen above, there are four general progressions of development: Trust in Nature vs. Mistrust in Nature, Spatial Autonomy vs. Environmental Shame, Environmental Competency vs, Environmental Disdain, Environmental Action vs. Environmental Harm. Based on a **psychosocial theory of identity**, progression through each stage is determined by a child's success in overcoming outer (environmental) and inner (emotional) conflicts attributed to healthy development. A child's experiences will be framed by familial, cultural, and societal values, but their movement through the stages will be determined by personal feelings and actions. The progression of Environmental Identity Development is fluid, meaning that the various progressions are frequently revisited, refined, and/or reestablished with new encounters and experiences *in*, *with*, and *for* nature throughout one's life.

Click on the topics to learn more about the EID Model, and look below to see examples from research of children navigating the four progressions.

Environmental Identity

Environmental identity is defined as an aspect of one's self-concept in relation to the natural world, as defined by Clayton (2003):

Environmental identity is one part of the way in which people form their self-concept: a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the way in which we perceive and act toward the world; a belief that the environment is important to us and an important part of who we are. (45–46)

Environmental identity is particularly important in that it considers how one's sense of self will direct one's actions and behaviors towards the natural environment (Clayton & Optow, 2003). There is a general understanind that a strong environmental identity will lead to environmental advocacy. However, there is little theory describing *how* these environmental identities develop and emerge. Furthermore, environmental identity has largely been studied in adult populations, whereas studies with children, and young children in particular, have been limited. The EID model and this research project aim to strengthen our understandings of environmental identity development in young children over time and across cultures.

A Pscychosocial Theory of Identity and Emotional Development

Psychosocial theory of identity and emotions. A psychosocial understanding of identity and emotional development recognizes that emotions and subsequently behavior are individualized and internalized and form the basis of one's identity (Erikson, 1980). The EID model is based off of Erik Erikson's theory and model of psychosocial development (1950; 1972; 1980). The four stages of his model include: Trust vs. Mistrust, Autonomy vs. Shame and Doubt, Initiative vs. Guilt, Industry vs. Inferiority.

The EID model recontextualizes Erikson's four stages of identity development as four progressions of *environmental* identity development. The child will navigate both inner and outer tensions throughout these progressions. Their experiences will be framed by familial, cultural, and societal values, but their progress will be determined by personal feelings and actions.

It is important to note that even children within the same social, cultural, or geographical contexts will not emotionally respond to nature in the same way. The internal attributes of a child as well as these outer influences all contribute to the way in which a child emotionally responds. In other words, every child is unique. Furthermore, these emotions are not static, but will change over time; the same stimuli as different ages and points of development) may elicit different reactions (Sroufe, 1997). Our longitudinal environmental identity research project examines how an individual's emotional response to environmental stimuli will change through sociocultural experiences and over time.

Education in/from, about, and for the Environment

The EID model is integrated with the Lucas (1979) environmental education model. An individual's learning experiences *in/from*, *about*, and *for* the environment influence and contextualize the progression of their EID.

Education *in* and *from* the environment emphasizes immersive play and learning in nature; through these activites, children begin to develop a sense of wonder and a relationship with the natural world (Chawla and Rivkin 2014). This type of education serves to promote a greater sense of trust and spatial autonomy in the natural world. Education *about* the environment focuses on building environmental knowledge, understandings, and awareness of ecological processes. This type of education will also ideally take place outside, but learning may also occur in the classroom. Education *for* the environment is promotes conservation behaviors and actions for sustainability (Davis 2010; Palmer and Neal 1994). These different education strategies situated at different progressions on the EID model, but educators are encouraged to utilize the strategies both before and after the suggested progression.

These learning experiences may occur with adults (i.e. caregivers and educators) and peers (i.e. siblings and friends) as well as through independent and social contexts. See this page to learn more about child-initiated EID activities in the natural world.

The EID Model and Cultural Contexts

It is essential to consider cultural contexts when applying the EID model. A child's environmental identity develops within the framework of familial, cultural, and societal values. Different cultures will view, perceive, and interact with the environment in different ways, depending on their traditional relationship with the environment.

For example, a person who has grown up in a city, primarily experiencing the natural world through recreational activities, will have a very different relationship with the environment than an Indigenous person living in a rural village, who regulary hunts and gathers their food from the local environment. Both of these individuals may have strong environmental identities, but their idenities will develop in unique ways.

It is important to recognize, respect, and honor these diverse ways of understanding and interacting with the environment. For educators, this includes recognizing and incorporating diverse cultural ways of learning and teaching.

Why the EID Model?

Relatively little is known about the emotional and behavioral processes that shape children's early interactions with nature, and how sociocultural values and norms inform a child's developing environmental identity. The EID model presents a framework for understanding these processes, and it may be used as a tool in the creating of education strageties that support and necourage a positive environmental identity.

Different theoretical frameworks can facilitate the creation of new pedagogies and educational approaches that center the child and incorporate diverse ways of knowing. The EID model is one such framework; the model integrates research-informed theories of child development, sociological perspectives of childhood, and environmental education approaches around the concept of environmental identity. The framework merges a sociocultural overview with individual analyses to understand children's individual growth within the context of their lived environments. This model may be used to inform and guide the creation of child-centered and multicultural education activities within the contexts of place-based education and environmental education.

The Four Progressions of Environmental Identity Development

Below, we have provided a series of video vignettes that showcase the four progressions as children experience them in the natural world. The events in these vignettes occurred over the course of our research with two cohorts: Cohort 1: Non-Rural Alaskan Children and Cohort 2: Rural Alaska. Most of these videos were created by the children themselves, recording their adventures with wearable cameras on their foreheads. As such, these vignettes provide unique insight into the perspectives of children as they explore the natural world. These videos reveal deep feelings and rich experiences that children have outside, and which adults are often unaware of.

It's important to note that these vignettes do not depict the moment a child graduates from one progression to the next. A child's environmental identity develops through a culmination of moments and micro-interactions. Rather these vignettes contextualize the four progressions, providing examples of how children may experience these tensions and progressions in the environment. We suggest possible education interventions and strategies to support these children as they navigate through the progressions. However, supporting a child does not always require direct and active intervention. Sometimes, the most effective strategy is to allow a child the opportunity to face these challenges on their own, while being a supportive but unobtrusive adult presence.

Trust in Nature vs. Mistrust in Nature

In the first progression, *Trust in Nature vs. Mistrust in Nature,* feelings of trust and security are considered foundational to a child's environmental identity development. Mistrust in nature would emerge from fearful and anxious encounters with nature that are not adequately negotiated.

Into the Woods

Description: Daniel walks on a snowy trail through the woods. He's several feet ahead of his teacher and classmates, and he occasionally turns to look at them. As he walks, he chirps like a bird, howls like a wolf, and roars like a bear. After one deep growl, he pauses to look around at the trees. He nervously says, "Um... are you sure this is okay forest?" He waits for his nearest classmate to pass him. Daniel then sees his teacher approaching, and he resumes walking and chirping.

Explanation: Daniel is currently navigating the first stage of EID. Initially, he appears confident on the trail. However, he soon expresses uncertainty and fear in his surroundings. His chirping and howling may be an expression of anxiety or a self-regulatory technique. Fortunately, the presence of his classmates and teacher allow him to regain confidence and continue walking on the trail.

If a sense of *Mistrust in Nature* grows, environmental discomfort may overwhelm the desire to explore, leading to *Environmental Shame*. However, with the support of his teacher, peers, and other caretakers, Daniel can develop a stronger sense of *Trust in Nature* that allows him to grow in his relationship with the natural world.

Danger on the Ice

Description: It's early spring, and Andrew is near the bank of a frozen lake with his teacher, classmates, and other parents. His teacher tells the children to stay off the lake because the warming weather may have thinned the ice. Andrew decides to walk onto the ice, only returning when his teacher calls him back. A few days later, Andrew's class is out by the lake again. The teacher has just shared a story about falling through the ice, explaining to the children why they should stay off the ice. Andrew goes to the bank and rolls down the snowy incline onto the frozen lake surface. Once again, his teacher must call him back to solid ground.

Explanation: Andrew is not uncomfortable in nature, but he has not formed an appropriate foundation of *Trust in Nature*. These instances are complicated by a language barrier between Andrew and his teacher. *Trust in Nature* allows children to feel comfortable navigating the natural world aware of and in response to potential dangers. It is important for adults to model safe behaviors so that children can develop a healthy sense of trust.

Spatial Autonomy vs. Environmental Shame

In the second progression, *Spatial Autonomy vs. Environmental Shame*, a strong sense of trust in nature propels a child to venture out, independently or with others, to explore and claim their own places. The development of a sense of place allows a child to gain a sense of autonomy with their environment (Green, 2011; 2015). Contrary to spatial autonomy are feelings of environmental shame, which causes a child to withdraw and feel uncomfortable during nature experiences.

Navigating the Tundra

Description: Jackson is at the top of a rocky slope leading down into the tundra. His classmates walk around and past him, seemingly without difficulty, as they head to the tundra. Jackson takes a few uncertain steps before he stops and tells everyone else to do the same. He feels scared, and he doesn't know how to continue. A teacher comes up and gently encourages Jackson to keep walking. Jackson begins taking steps and makes his way to the tundra.

Explanation: Jackson is new to this environment, having recently moved to the area. He has not yet formed a foundation of trust in the environment and his abilities to traverse it. His mistrust in the environment leads to a moment of environmental shame. He tries to withdraw from the activity. Luckily, a teacher notices his discomfort and fear, and she is able to give him the support and encouragement he needs to traverse the rocks. Continued support will enable Jackson to develop a deeper sense of trust in the environment, which will empower him to practice greater spatial autonomy.

Running on the Beach

Description: As soon as Grace steps on the beach, she begins running and laughing. She begins to climb up a steep sandy hill with her friends. The climb becomes challenging, and she grunts as she uses her hands to pull herself up the hill. Nevertheless, she continues to giggle throughout the climb, bursting into laughter at the top. She steps onto a driftwood log and fearlessly jumps down, yelling "Cannonball!" She notices a strange item in the sand, a small plastic cup, and she begins to experiment with its use in the sandy environment.

Explanation: Grace is demonstrating a strong sense of spatial autonomy. She feels comfortable in the environment, and she readily traverses the environment in various ways, from running through the sand, to climbing up the hill, to jumping off a log. She is happy to explore this environment surrounded by friends. Her strong spatial autonomy allows her to readily develop environmental competencies in her ability to physically navigate and explore the beach.

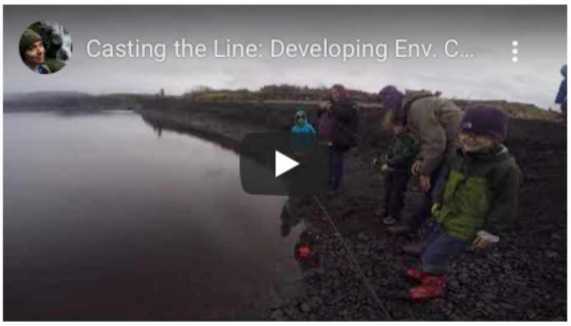
Environmental Competency vs. Environmental Disdain

In the third progression, *Environmental Competency vs. Environmental Disdain,* children gain confidence in their interactions with nature by acquiring skills and ecological understandings of place (Green, 2013). Feelings of guilt, or a lack of confidence and ecological understanding lead children to demonstrate environmental disdain, or a disregard for nature.

Climbing the Tree

Description: Jennifer is determined to learn how to climb a tree. She walks around the stand of trees, looking for "an easy tree." She notices the tree-climbing skills of her classmates and uses them as motivation for her own learning. She self-talks throughout, encouraging and reassuring herself that, with practice, she will learn how to climb a tree.

Explanation: Jennifer struggles with climbing trees compared to some of her classmates, but she feels determined and empowered to continue practicing. Her self-talk enables her to express and encourage herself. If she were to become overwhelmed to the point of discouragement, she might lose interest or even begin to dislike climbing trees, leading to environmental disdain. However, with continued practice and the support of her caretakers, Jennifer will overcome these obstacles and develop competent tree-climbing skills. Here she comes!



Casting the Line

Description: Owen has his fishing pole ready with bait, but he is unsure how to cast the line. He goes up to an adult and asks for help. She demonstrates how to cast the line, making sure he helps her through the process. Afterwards, Owen attempts to cast the line by himself, but he can't seem to get it right. Finally, he makes a successful cast and he joyfully yells, "I did it!"

Explanation: Owen is developing the environmental competency of fishing. Although he struggles initially, with an adult's assistance, he overcomes his difficulties and begins to successfully cast his line. The happiness associated with Owen's success will propel him to further develop his skills and competencies in fishing. This positive experience, along with his growing skills, is preparing Owen for the next progression in EID: environmental action.

Environmental Action vs. Environmental Harm

In the fourth progression, *Environmental Action vs. Environmental Harm*, through successful progression in the previous stages, children develop moral values and the know-how to engage in *Environmental Action*. Failure to progress through one or more stages would result in intentional or unintentional environmental harm.

Killing the Spider

Description: Three girls stand around a wooden trail marker, Amanda, Brittany, and Jennifer. They notice a small spider at the base of the marker. The girls squeal, and Amanda and Brittany say they are afraid of spiders. Brittany decides to kill the spider. Amanda and Jennifer immediately express sympathy for the "poor buggy." Brittany, thinking that Amanda had been fearful of the spider, asks her if she liked it when she killed it. Amanda does not respond.

Explanation: These three girls are negotiating the tension between *Environmental Action* and *Environmental Harm*. The girls exhibit some *Mistrust in Nature* in their fear of the spider, but they also express sympathy for it after it dies. Many different factors may have influenced the events and actions in this video, from past experiences to the current social dynamics. Educators should revisit the earlier stages of the EID model to ensure these children have a solid foundation of *Trust in Nature*. Furthermore, by learning more about spiders and their role in the ecosystem, the girls can develop their *Environmental Competency*. This knowledge would allow them to understand that this spider was simply existing in its home and posed no real threat.

Protecting the Flowers

Description: Steven notices some bright red plants on the tundra floor. He gazes upon them, saying they are "so pretty." He looks up and sees that no one else is paying attention to the red flowers. He realizes others are unintentionally stepping on the flowers. He yells at them to stop, but no one responds. He finally gets the attention of one peer, Owen, who listens and looks down at the flowers.

Explanation: Steven's sense of trust and comfort in the environment allows him to easily build a connection with the natural world. He immediately feels an affinity for the red flowers and a strong desire to protect them. Although his *Environmental Action* may be of a relatively small scale, he is indeed acting to protect the environment with the skills available to him. Educators can encourage Steven's care and concern for nature and build upon it as he develops his competencies and capacity for *Environmental Action*.

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Appendix E.1

Nurturing EID Through Place-Based Activities webpage

Developing one's environmental identity can be as simple as going outside, but it does not end at going outside.

Below, we have organized a collection of place-based activities according to theme and topic.

These place-based activities encourage learning from and within the local environment. Some of these activities are well-known classics, while others may be new to you. These activities are intended to get people outside and interacting with the natural world. It's through these interactions that we develop our environmental identities. The process of EID may be lifelong, and so we have provided suggestions on how to implement these activities with both children and adults.

Child agency is an important element of both EID and PBE, and so these activities are designed to support individual interests and creativity. Remember to allow space for participants' authentic interactions with the natural world, even if they seem unrelated to the activity at hand. Responsiveness to the interests and actions of your learners should be at the heart of these learning activities.

Nature Journaling

Journaling provides a valuable way of exploring, expressing, and collecting one's thoughts about their relationship with nature. We share three different methods of nature journaling for all ages.

Scavenger Hunts

Scavenger hunts are timeless for a reason. These activities encourage independent exploration, critical thought and problem-solving. They are also easily applicable from a playground, to a park, to a nature reserve.

Tracking the Seasons

Week to week, and sometimes even day to day, we can observe new waves of seasonal change sweep over the landscape. When we become more aware of these changes, we become more in tune with our local environment.

Art in Nature, Art from Nature

Artistic interpretation and expression can be powerful methods for connecting with the natural world. Used in conjunction with PBE, art can provide new ways of reconnecting with the natural world, the human community, and ourselves.

Developing Cultural Connections to Place

This section provides an example of a mini-educational unit designed to encourage ecological, cultural, and historical place attachment in elementary age children, centering Indigenous understandings of land.

Appendix E.2

Nature Journaling Webpage and PDF Contents

Nature Journaling

There many ways of exploring and experiencing the natural world. Journaling provides a way of exploring, expressing, and collecting one's thoughts about their relationship with nature. Journaling is an opportunity for productive for self-reflection, allowing individuals a chance to internalize and consider their interactions and relationship with the natural world (Simms & Shanahan, 2019). You can journal as often or rarely as you wish. It's important to recognize that there are many ways of nature journaling, and every way is valid. When we begin journaling, we may not know the "right" way for us. Take time, be patient, try different things, and look for inspiration from other nature journals and the natural world itself.

EID Connections: These activities encourage children to mindfully explore and interact with nature. Through these interactions, children can develop a greater sense of trust in nature. Journaling may influence greater observation and inquiry, leading to increased environmental competencies. Journaling can also provide a way of reflecting upon and regulating emotions within the natural world. Finally, journaling encourages greater connection to and empathy with nature.

What counts as Nature Journaling?

- Describing what you see in Nature
- Describing the emotions you feel in Nature
- Describing a full sensory experience in Nature, what you see, hear, smell, touch
- Describing the difficulties or challenges you face while in nature
- Telling stories about adventures with friends and family in nature
- Drawing pictures of what you see or think about while in Nature
- Combining drawings and words
- Relating spiritual/religious feelings and thoughts in or about nature
- Writing in bullet points

- Writing in long narrative structure
- Writing poetry
- Writing a short story inspired by Nature
- Anything else that works for you!

Nature journaling can be tied to subjects such as:

- Science: Use the journal to make jot environmental observations and create scientific illustrations. Reading through the nature journals of prominent scientific figures can add to experience.
- English/Language Arts: Explore various ways in which one can use language to describe the environment: literally, figuratively, emotionally, scientifically, etc.
- Art: Try to capture the natural world in drawings and paintings. Perform studies on singular objects and scenes, or experiment with drawing various forms and processes in nature.

Materials needed:

- A notebook or journal**
- Writing or drawing utensils

** A sturdy notebook is preferable if it will be taken outside often. Children (and adults) may like creating and decorating their own journal. This can easily be done with paper, discarded cardboard, and staples or string for binding.

Different Journaling Activities

5-Senses Nature Journaling (Created for lower elementary, Adaptable to older ages)
The following activity is adapted from a lesson plan by Emma Heslop, a 2nd Grade teacher in Fairbanks, AK. See full lesson plan here:
https://drive.google.com/file/d/1wTwOw92LdWIHD69edHg25bC_-ONu7Qxe/view?usp=sharing

Activity: Children will study and reflect on the nature journals of historic figures. They will then have an opportunity to explore the local environment using their five senses, before engaging in a guided journaling experience.

Explanation: "Nature journaling is when we go outside, observe the natural world using our five senses and reflect on what we observed and what we felt in our nature journal. Your nature journal is a private space to help you connect with and reflect on the natural world."

Using Mentor Texts to create a baseline understanding

Children study an example page of a famous person's nature journal (such as Albert Einstein, Charles Darwin, Margaret Mead, Rachel Carson, Gandhi, Thomas Jefferson, Eleanor Roosevelt and John Muir (Project Learning Tree, p. 1)). Have children work together to make a list of what they notice about the nature journals. Children may notice pictures and words, labels, descriptive language, that it is about nature, and that it includes the author's feelings.

Outdoor exploration

What do you notice?
What do you see?
What do you hear?
What do you smell?

Nature Journaling

Reflect on what you feel in this space.
What do you feel connected to? How does it make you feel?
Who are we sharing this space with?
What makes you think that?

Closure: Give time for children to share from their nature journals

Go around the circle and share a word that describes your experience journaling in nature today. For example, "inspired."

For older children: Provide children with these questions and prompts beforehand. Allow them time to find space of solitude outside (if they are comfortable doing so) to answer these questions by themselves.

Focused Journaling

This is a simple exercise to encourage thoughtfulness in the natural world. Participants will "focus" their journaling on a singular object. Participants will explore a natural area and find a small natural object that they can easily carry in one hand. This object could be a lichen-covered stick, a rock, a dried leaf, etc. Try to find objects that are not "attached" to anything, i.e., nothing you have to pluck off a plant or pull out of the ground.

Participants will come together as a group to hear the guiding questions, or work with pre-written questions. They will be asked to ponder and explore the object in detail. They can answer the questions through writing or drawing. Questions may include:

- What does the object look like?
- What does the object feel like?
- How does the object make you feel?
- What does the object make you think about?
- What does the object remind you of?

The object of focus can be expanded to other larger entities, such as a tree or a body of water. The focus could also be expanded to be one's immediate surroundings, or the natural scene that surrounds them. In these instances, you may want to encourage participants to find a place of relative solitude to observe their surroundings and record their thoughts.

Group Journaling

Journaling is typically understood to be a solitary activity, but group journaling provides new opportunities for creative collaboration and community development. Different "groups" can include classrooms, families, hiking groups, and campers. A group journal can be maintained

over long periods of time, or it may be used to document a singular or short-term experience. In the case of a singular event after which the group is separating, the journal may be photocopied, so every group member can keep a digital or printed copy of the journal.

Group Journaling Practices:
Below are different possible methods and techniques for organizing a group journal. Recommendations are made for different ages and contexts, but feel free to adjust or adapt techniques according to the needs and abilities of your group.

For young children:
Provide each child with their own page in the journal. Work with children on an individual basis to create their journal pages. Older children may be recruited to help younger children in the creation of their pages. Prompts for the children may include questions or pictures taken during nature activities. Children can draw pictures, and their helpers can write down quotes from the children.
Prompts can include:

- What were you/we doing in this picture?
- What was your favorite part of (this experience)?
- What did you learn?

This technique was used to create journals for pre-school children during the course of EID research. Find the journals children produced here:
https://drive.google.com/file/d/1go3EY0SjjFYZpT7aYLroBcoGu9nK2hb0/view?usp=sharing

For an ongoing, multi-day experience:

- Pass the journal to someone new every day. Individuals can write or draw new entries. They can respond to earlier entries. They can draw or doodle on earlier entries.
- Create "small" groups of 2-4 people who share a journal. They can decide how to organize themselves, whether they wish to pass the journal around or create entries together.
- Put the journal in an accessible location and provide time every day or every week for people to write in the journal as they wish. One consideration is that the journal must remain in the same general location.
- At the end of the experience (if there is an end), encourage everyone to write a last closing entry about the nature experience, their feelings about the community, and what lessons or mindsets they hope to take with them.

With a shared journal, it is vital that participants practice respect for everyone's journal contributions. Earlier entries can be added to or built upon, but they should never be erased or marked through (unless at the discretion of the caretaker/educator).

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Appendix E.2a

Nature Journaling Standards-Based Lesson Plan PDF Contents

Lesson Title: Nature Journaling: Exploring and Reflecting on Nature Outside the School

Grade/Subject Area: This lesson is written for 2nd grade and integrates science and writing.

Time/Duration of the Lesson: Approximately 1 hour

Technology or Materials Needed: nature journals for every student, writing utensils, weather appropriate gear, examples of nature journals from famous scientists, politicians, writers, and naturalists.

Location & Context: This lesson was created at an elementary school in Fairbanks, Alaska. The school is surrounded by evergreen trees and lies near the Chena River. This lesson plan was created by 2nd grade teacher Emma Heslop. This lesson plan has been adapted from its original form as graduate course paper.

Objectives:
Students will experience and reflect on the nature right outside their classroom, noticing it deeply and beginning to grow place attachment in this environment.

Standards

Alaska State Writing Standards for 2nd grade

"Text Types and Purposes

3. Use narrative writing to retell a well-elaborated event or short sequence of real or imagined events, include details to describe actions, thoughts, and feelings, use linking words to signal event order, and provide one or more concluding sentences that restate or emphasize a feeling or lesson learned.

Research to Build and Present Knowledge

7. Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report or visual or oral presentation; record data from science observations). 8. Recall information from experiences or gather information from provided sources to answer a question.

Comprehension or Collaboration

3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue" (Alaska Department of Education and Early Development, 2012, p. 3-4).

Alaska State Science Standards for 2nd grade

"2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats" (Alaska Department of Education and Early Development, 2019, p. 46)

"K-2-ETS1-2Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem" (Alaska Department of Education and Early Development, 2019, p. 55).

Introduction (5 minutes)

Today we are going to be starting nature journaling. Nature journaling is when we go outside, observe the natural world using our five senses and reflect on what we observed and what we felt in our nature journal. Your nature journal is a private space to help you connect with and reflect on the natural world. Many famous people used natural journals such as Albert Einstein, Charles Darwin, Margaret Mead, Rachel Carson, Gandhi, Thomas Jefferson, Eleanor Roosevelt and John Muir. First, we are going to start off by looking at some examples of these famous nature journals to learn what nature journals contain and what they are for. Then we are going to go explore the wooded area by our playground. After exploring, we are going to start writing and drawing in our own nature journals. When we come back inside, you will have the opportunity to share your nature journal and your reflections with the class if you would like to. We will be using our nature journals to inspire our poetry in coming lessons.

Lesson Procedures

Using Mentor Texts to create a baseline understanding (10 minutes)

Have students return to tables, each table has an example page of a famous person's nature journal. Have groups of four work together to make a list of what they notice about the nature journals. Come back together and make an anchor chart for nature journals based on what the students noticed from their mentor texts.

I expect that students will notice pictures and words, labels, descriptive language that it is about nature, and that it includes the author's feelings.

Gear up, and go outside to the wooded area (5 minutes)

Outdoor exploration (10 minutes)

What do you notice?
What do you see?
What do you hear?
What do you smell?

Nature Journaling (10 minutes)

Reflect on what you feel in this space.
What do you feel connected to? How does it make you feel?
Who are we sharing this space with?
What makes you think that?

Come back inside and take gear off, bring nature journals to carpet (5 minutes)

Closure: Give time for students to share from their nature journals (10-15 minutes).

You all did such a good job exploring and taking care of our wooded area. Your nature journals are amazing. I noticed that NAME did this and NAME noticed that. Who would like to share with their class what they did in their nature journal today?

Wonderful. Thank you for sharing. Now we are going to go around the circle and share a word that describes our experience journaling in nature today. My word is "inspired."

Appendix E.3

Scavenger Hunt Webpage and PDF Contents

Scavenger Hunt

Scavenger hunts are timeless for a reason. Both children and adults enjoy scavenger hunts. These activities encourage independent exploration, critical thought and problem-solving. They are also easily applicable from a playground, to a park, to a nature reserve.

Depending on your local environment and ecosystem, you can make your scavenger hunt more or less specific. You can make a general scavenger with items like "something rough" or "something red." For a more specific and directed hunt, you may include specific specimens, like "the tree with three trunks." Each type of scavenger hunt will have it benefits, and it is possible to mix elements of both hunts.

EID Connections: Children exercise spatial autonomy as they seek each item on the scavenger hunt checklist. Scavenger hunts can also be supported by maps and mapping activities, increasing skills of environmental competency. Finally, the activity encourages greater connections with nature, as children feel a sense of accomplishment with each new discovery in nature.

A "General" Scavenger Hunt:

A general scavenger hunt will have a list of descriptive items that could apply to several different natural objects. It may also have items that describe sensory experiences. Children and participants can even help create the list. Such a list could include:

- Something green
- Something that feels rough
- Something that feels smooth
- Something pointy or prickly
- Something beautiful
- Something interesting
- Signs of an animal or animal home
- The sound of a bird
- The sound of running water
- The smell of water

Depending on your ecosystem and season, you can include more specific items, like a particular species of tree, a type of lichen, a purple flower, etc. General types of descriptors allow children to express creativity in their discovery and selection of findings. Keep in mind, adding more specific items that you know to be in different locations (or harder to find) may encourage children to wander and explore farther away from the starting point.

Children may work alone, in pairs, or small groups. Participants will not be "collecting" items, but they must have some way of recording their discoveries. These could be through written descriptions, drawings, or pictures taken with a camera or smartphone. If a map of the area is

available, children can practice marking the general locations of findings on a map. Alternatively, children could *make* a map depicting their path and location of findings.

Remember, children don't need to find everything on the list! Encourage children to take their time and enjoy their explorations. The scavenger hunt is a guide, not a test.

A "Directed" Scavenger Hunt:

A directed scavenger hunt requires children to find specific items at specific locations. This type of hunt allows for less diversity in the types of items children find. Instead, this hunt requires children to decipher clues or understand directions in order to find each item on the list. Furthermore, this scavenger hunt may require or encourage children to explore off-trail or distant areas that they otherwise would not seek out.

The list of items can be presented in a variety of ways:

- A series of written clues
- Clues drawn as pictures
- Specific descriptors, e.g. "the tree with three trunks," "the moose antlers," "the bridge over the stream"
- Specific locations on a map
- Written directions, e.g. "walk past where the trail bends and look the left"
- Orienteering: providing degrees on a compass and paces to follow

With this activity, pairs or small groups may work best, as children will often be headed towards the same location anyway. To stagger the groupos, they may be released at different locations or given clues in different orders.

Since children are finding specific things, there are a couple of ways for them to demonstrate that they did indeed find the right object/location:

- Participants can take a picture of the finding with a camera, smartphone, or tablet.
- Questions may be provided to participants that can only be answered by finding the right location/object (e.g. How many prongs did the deer antlers have?).
- The hunt designer can leave clues or letters at each location. For example, they may leave a letter at each location, and the collection of letters result in an anagram that must be unscrambled.

To learn more about Environmental Identity Development and education resources, visit https://sites.google.com/alaska.edu/eidproject/project-overview

Appendix E.4

Tracking the Seasons Webpage and PDF Contents

Tracking the Seasons

We all understand that the earth undergoes seasonal changes, and we generally understand there to be four seasons: spring, summer, fall, and winter. We differentiate the seasons by changes in day length, shifting weather patterns, and changes in the plant and animal community.

Seasons begin and end on specific dates according to the solar calendar, but does a season arrive all at once? Do all the flowers bloom at the beginning of spring? In fall, do all the leaves drop off of the trees at the same moment on the same day? Of course not! There's a pattern and progression to these seasonal changes. Each season fades and builds into the next through a series of small changes. Week to week, and sometimes even day to day, we can observe new waves of change sweep over the landscape. When we become more aware of these changes, we become more in tune with our local environment. We gain a greater appreciation for our local environment as we come to know the richness of the landscape.

EID Connections: This activity encourages greater spatial autonomy and develops one's environmental competencies in reading the natural landscape. With supplemental activities listed below, one can practice environmental action.

The Activity: Tracking Seasonal Changes

This activity encourages you to notice and track the seasonal changes in your environment. The "environment" where you note these changes could be anywhere, from your backyard, to the park, to your local nature trail. See the **Closing Activities** for suggestions on how to incorporate this activity into academic subjects.

For young children: Choose fewer categories to track changes in. Allow children to record their observations through drawings.
For older children, adolescents, and adults: Encourage detailed observations (drawn or written) and species identifications in recordings. Use the supplemental activities to participate in citizen science activities.

Note: Scientists call the study of seasonal changes '*phenology*.' There are certain times of year we expect to see the weather change, see plants grow, watch animals migrate. Sometimes these seasonal patterns shift, occurring earlier or later, and scientists learn more about the environment through observation of these changes.

Materials needed:

- A notebook or blank calendar
- Pencils, pens, crayons, etc.
- Identification guides for reference** (May be found online)
- Possible: Small note-taking book, phone or camera for pictures, binoculars

**Identification guides: Local bookstores and parks are great places to look for identification guides for your local flora and fauna. There are many excellent online resources and smartphone apps that can help identify specimens as well (e.g., iNaturalist can often help identify any type of plant, animal, fungi). And of course, you don't have to identify everything you see! Noticing and describing the changes you see is what's important.

Guidelines:

This activity requires you to be out in your environment with regularity. You can choose to note the seasonal changes every day or every week (soon, you'll notice the changes without actively trying). Choose at least one day a week to note seasonal changes, adding more days if you choose. Try to note changes within the same general location, whether that be your yard or the local nature trail. While outside, slow down and be mindful of your environment. Practice intentional awareness and observation. As you grow more familiar with your environment, it will be easier to notice new changes. You may find yourself growing excited with each new observation!

Types of Changes to Note:

These changes will obviously depend on both the season and the ecosystem in your region. We recommend picking as few or as many of these options as you wish. Without much prior knowledge (or with young children), weather and plants may be the easiest to track.

- Weather changes (temperature, rain, clouds, snow, wind, etc.)
- What flowers are blooming?
- What trees are growing leaves/changing color/losing leaves?
- What nuts or seeds do you see on the ground?
- What animals do you notice (or hear)?
- What birds are around?
- What berries or fruits are in ripe?
- Are the grasses green or brown?
- How high or low are local bodies of water?
- Are any mushrooms or fungi growing?
- Anything else you notice!

Recording Your Observations:

- You can directly record your observations as you see them outside, or you can take a few notes/pictures to record them later.
- Changes can be recorded journal-style with a notebook, or on a large blank calendar.
- Observations can be written, drawn, or both (by both children and adults).
- We recommend continuing this activity for *at least 4-6 weeks*, but it may go on indefinitely.

Closing Reflections:

- Take an opportunity for reflection. Questions for reflection may include:
    - What did you find?
    - What did you learn?
    - What was exciting?
    - What was surprising?
    - How would you describe (season) now?
    - When do you feel like this season "began" or "ended," if at all?

Other possible closing activities may be incorporated to Math, Science, and English/Language Arts classes.

- Draw a few pictures showing different "stages" of the season based on your records.
- Create a "story" or narrative about the changing season, describing the changes of the season over time.
- Create a graph or chart tracking the presence and disappearance, blooming or dying, of different species over time throughout the season (Can also track temperature and weather events on a graph).
- If you can and have repeated this activity for multiple years, compare the observations from previous years at the same or similar calendar dates. What changed? What remained the same?

Supplemental Activity:
Older children and adults may use this activity as an opportunity to engage in citizen science and phenology research.

Project Budburst http://budburst.org specifically tracks plant life cycles for the purposes of phenological research. Children and adults can upload their observations of seasonal plant changes onto the website. In doing so, they are contributing to real ongoing research. Do an online search for citizen science and phenology to find new or different projects to participate in.

To learn more about Environmental Identity Development and education resources, visit https://sites.google.com/alaska.edu/eidproject/project-overview

Appendix E.5

Art in Nature Webpage and PDF Contents

Art in Nature, Art from Nature

Artistic interpretation and expression can be powerful methods for connecting with the natural world. Through art, we can relate distant scientific notions and environmental issues to our lived experiences; an artistic approach can infuse the objective and factual with creativity and emotion (Inwood, 2008). Used in conjunction with PBE, art can provide new ways of reconnecting with the natural world, the human community, and ourselves. There are many resources online and in books for nature-inspired art activities. Below, we are providing a simple yet meaningful art project to help explore and connect with your place.

EID Connections: This activity encourages greater spatial autonomy, as participants are inspired to explore and discover in the natural world. Through careful observation, a child can develop a better understanding of the natural world, increasing their environmental competencies. Many artists use their art for environmental action and activism, as they heighten awareness about environmental issues in the world. Additionally, creating art can aid in one's emotional self-regulation. It increases connection with nature, as well as empathy for the natural world.

The Activity: Winter Color Challenge *or* Nature's Color Palette

The following activity was developed by West Virginia-based artist and educator Rosalie Haizlett (rosaliehaizlett.com).

This activity is a fun tool to help children and adults slow down and become more observant while outside. It was designed in the context of winter, with the goal of encouraging people to notice and appreciate the colors in the "dullest" season. This activity encourages spatial autonomy in exploring the natural world.

Materials needed:

- Drawing or painting tools (pastels, colored pencils, watercolors, crayons, etc.).
- Paper, notebook, nature journal, etc.

The Activity:

- Take a hike/stroll through the woods, a park, or even your backyard. On your walk, pay extra attention to the ground to look for colorful natural items like mossy sticks, stones, fallen leaves, fungi, seashells, etc.
- Collect a few items that have colors you like, taking care not to pick any living things. IMPORTANT: If you are in a national park or nature preserve, make sure to practice "Leave No Trace" ethics (https://lnt.org/learn/7-principles) and simply take pictures of the colorful items instead of collecting or disturbing anything.

- Next, create your color palette. This may be done outside during your walk, or inside after your walk.
- Lay out the things you collected or get out the photos that you took. Choose a few colors that you like from the inspiration you've collected and use your art materials to try to replicate the colors of the items onto your paper.
- After creating your color palette, write the location of your hike on the paper!

Supplemental Activities:

- Using your new color palette, draw or paint an abstract image expressing the feeling or atmosphere of the environment.
- Using your new color palette, write, color, and decorate a word that describes your experience or feelings on the hike, e.g. happy, beautiful, mysterious, adventure, melancholy.

To learn more about Environmental Identity Development and education resources, visit https://sites.google.com/alaska.edu/eidproject/project-overview

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Appendix E.6

Developing Cultural Connections to Place Webpage and PDF Contents

Developing Cultural Connections to Place

One of the education initiatives of our research project is teaching Indigenous cultural values in relation to the environment and place. Education Indigenous to place recognizes that traditional ways of knowing are taught through stories and by way of demonstration (Barnhardt & Kawagley, 1999). Through lessons that emphasize traditional ecological understandings, children will develop a deeper connection to their environment and place.

Below, we provide an example of a mini-educational unit designed to encourage ecological, cultural, and historical place attachment in elementary age children. This project is contextualized to Southern Appalachia and the Eastern Band of Cherokee Indians, but the activities developed for this unit are applicable to other places, with necessary adjustments to capture the history and resources of your place.

While these lessons are valuable techniques for exploring and connecting with the historic and cultural elements of place, the creator John R. Henry acknowledges that he is non-Native, and these lessons would benefit with greater input from Cherokee elders and teachers.

EID Connections: The four lessons of this unit provide opportunities for children to develop spatial autonomy and environmental competency. The lessons greatly encourage both personal and cultural connections to nature.

Rootedness in the *Unta'kiyasti' yi* Watershed: Encouraging Ecological, Cultural, and Historical Place Attachment in Southern Appalachia

This mini-educational unit was created by John R. Henry, a former graduate student of the M. Ed. People, Place, and Pedagogy program at the University of Alaska Fairbanks. The following has been simplified and adapted from its original form as a graduate project and course paper.

The main objectives of these lessons are to give an introductory experience to children in connection to nature and to inspire wonder at the rich cultural history embedded in place. This mini educational unit for elementary school ages aims to explore holistic notions of Land education and encourage connection to place in the areas in and surrounding Asheville, North Carolina. The Land Education model represents a holistic view that draws upon critical pedagogy of place, centering Indigenous understandings of land and affirming the need for place-based educators to "think about what non-colonial relations might look like both in theory and practice" (Calderon, 2014, p. 28). Therefore, this project is framed and influenced by a recognition of the Cherokee people as the original inhabitants and knowers of the land.

The four lessons of this unit provide opportunities for children to develop spatial autonomy and

environmental competency. The lessons greatly encourage both personal and cultural connections to nature.

Briefly, the four lessons are:

Lesson 1: Cultural Mapping and Bioregions of the *Unta'kiyasti' yi* Watershed
- Children draw maps of the local watershed and learn Cherokee names/meanings

Lesson 2: Exploring *Unta'kiyasti'*
- Children take a fieldtrip to explore the local river

Lesson 3: Cultural and Historical Rootedness in Place in ᏩᎳᎩ [Cherokee]
- Children take a fieldtrip to the local Museum of the Cherokee Indian

Lesson 4: Report and Presentation
- Children create a report reflecting on their experiences and new understandings of place

Context: These lessons were designed in Asheville, NC. The French Broad River that winds through present-day Asheville, North Carolina is known as Unta'kiyasti', literally, "where they race," which refers to the rushing waters of the river's rapids (Native Languages of the Americas, 2015). Asheville lies near Cherokee, NC, or the Qualla Boundary, the tribal lands of the Eastern Band of Cherokee Indians. These lessons were designed to be applicable in a school context. John R. Henry performed a trial implementation with his own children, a first grader and a third grader.

Lesson 1: Cultural Mapping and Bioregions of the *Unta'kiyasti' yi* Watershed

This lesson utilizes the concept of cultural atlases, which are developed through the study of original Indigenous place names and include documenting the knowledge of traditional uses and memories of those places (Topkok, 2014). This lesson also draws upon the concept of drawing one's bioregion, developed by Berg (2005). Merging these concepts, children will work with their teacher to draw maps of their local watershed, incorporating Cherokee names and meanings.

Materials needed:
- Paper, colored pencils or crayons
- A (pre-existing) geographic map of the area
- Glossary of local Indigenous place names. This project utilized a compilation by Chestnut (1991).

Activity:
With the help of the teacher, children will map the area around their home and city, paying special attention to the streams near their homes and how they connect to the main river that dissects the city. Depending on age and skill of children, the teacher may provide a dotted line for the river that children can trace. Other landforms, such as mountains and valleys, may be drawn on the map.

Major cultural place names in the Cherokee language will then be marked on the map. Teachers may also mark the approximate points that were ancient Cherokee settlements or sacred places on the map. Children can copy these place names themselves. If the proper pronunciation is known (or a recording is available online), children may practice saying these names.

To close the lesson, children will listen to a traditional story about the mountains around this area called *Yonder Mountain* as told by Robert Bushyhead (Bushyhead, 2002; Duncan, 1998). Provide reflection time after this story. Encourage children to think about the themes and messages in the story. Connect the setting and happenings in the story with the places on the children's map, and remind them these places are all around them.

Lesson 2: Exploring *Unta'kiyasti'*

Studying local streams and rivers and how they relate to the greater watershed is integral to developing an ecological understanding of place. Sobel (1996) suggests the chronologically expanding study of local watersheds, called stream grooming and stream following. For this lesson, children will identify the closest stream to their home and trace it on their map to the *Unta'kiyasti'* river. They will then be taken on a field trip to the French Broad River Park, a nature trail that follows the river for several miles.

Materials needed:

- Pencil and drawing pad for each child

Activity:

After tracing their nearest stream to the *Unta'kiyasti'* river on their map, children will visit the river at the French Broad River Park. If possible, try to find and follow the nearest stream to the *Unta'kiyasti'* river. Once at the park, children will be allowed to individually and collectively explore the greenbelt around the river, touching treasures of rocks, leaves, and earthworms along the way. With their drawing pad, children will be encouraged to draw or sketch any combination of five plants, animals, or natural objects that make them feel happy about this river. Teachers may set limits (according to age and competency levels) how far students may wander from supervising adults.

The lesson will conclude with lunch and time of reflection in the park, followed by a storytelling of "How the Possum Lost His Tail" (Arch, 1998).

Lesson 3: Cultural and Historical Rootedness in Place in GWY [Cherokee]

Materials needed:

- Children should bring their maps and their notebooks used for observational drawings at the river
- A camera or camera-phone to take pictures or record language pronunciations

Activity:
In preparation for this second field-based lesson, children will bring along their cultural maps, as well as their observational drawings and a notebook. They will travel to the Museum of the Cherokee Indian within the Qualla Boundary, the tribal lands of the Eastern Band of Cherokee Indians. In groups of two, the students will participate in the self-guided tour of the exhibits. They will take notes of ten things that appear most interesting to them about the different exhibits.

At some point along the tour, they will seek out one of the several Cherokee language experts for help in pronunciation of place names on their map. They will also inquire of the language experts if they happen to know the name for the subjects they sketched in their observational drawings. Students will ask their teachers for assistance in using the teacher's smartphone to record, with the permission of the language expert, the correct pronunciation of these names.

If you do not have such a resource available, consider:

- Do any local Native groups host powwows, ceremonies, conventions, or festivals that are open to the general public?
- Are there local Native persons who practice as teachers or storytellers outside of their tribe and community?
- Are there local history museums or parks that incorporate local Indigenous culture and history? (This may need to be supplemented with more modern resources created by Indigenous peoples.)
- Are there any local archaeological sites of former Native settlements (Once again, try to find Indigenous-created resources about this place, if possible.)
- Are there interactive online resources about (the specific) Indigenous culture, language, and place?

Lesson 4: Report and Presentation

Shortly after the first three lessons, children shall be allotted special time to devote to a creative written and/or multimedia report of their findings. This report will be primarily a reflection of their affective responses to the map making, river walk, museum, and new understandings of the historical and cultural aspects of their place. Their report should include the maps, drawings, audio recordings, and any student-captured images. Pictures inside the Cherokee museum should only be taken or included with the explicit permission of museum administration.
This project provides an important opportunity for self-reflection and allowing children to make connections between themselves and their education experiences.

To learn more about Environmental Identity Development and education resources, visit https://sites.google.com/alaska.edu/eidproject/project-overview

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Appendix F

"Spontaneous" Child-Initiated EID Webpage

EID Activities:

Climbing in Nature

Imaginative Play

Stick Play

Educators and caretakers play a vital role in supporting the healthy EID of children, but oftentimes we can best support children by simply allowing kids to be kids.

We encourage adults to recognize children's self-initiated play and exploratory behavior in the natural world as important and influential interactions for their EID. We use the word "spontaneous" to describe these activities, because they occur without planning on the part of the adult or child. They are spurred by a child's interests and the environment itself. For young children, outdoor play in natural settings increases the diversity of play behaviors (Zamani, 2016), as well as supports imaginative play and prosocial behaviors (Dowdell et al., 2011). Outdoor play also exposes children to new risks and unpredictable environments, allowing them to experience success and failure and to develop self-regulation strategies (Bento & Dias, 2017).

We observed children climbing, engaging in imaginative play, and playing with sticks in both our rural cohort and non-rural cohort. The nature of play and the relative skills of the children differed between and within cohorts at times. Nevertheless, children repeatedly sought out and engaged in these activities across contexts.

These activities may seem cute and commonplace from viewpoint of adults bystanders, but our research methods provide us unique insight into the perspective of a child. Below, we are providing several videos from the vantage of children, ages 4-5, with wearable cameras on their foreheads. Through these videos, we see how truly physically and mentally challenging an activity like climbing a tree may be for a child. We hear how a child's imaginative self-talk transforms an unfamiliar thicket into their own "house" complete with "doors." We see how sticks become tools of imagination and exploration, giving children greater confidence to explore their environment.

Adults can encourage these activities by providing the *space and time* for these activities to take place. Longer periods of uninterrupted play time in natural settings allow children to engage in more meaningful ways with the environment, providing an "opportunity to get lost in their play" (Kiewra & Veselack, 2016, p. 89). Adults should play a supportive role, rather than a directive role, in these settings. With a supportive, but unobtrusive presence, adults can monitor outdoor activities without disrupting play behaviors (Kiewra & Veselack, 2016). Adults, of course, can participate in these play behaviors at the request or invitation of children.

Climbing in Nature

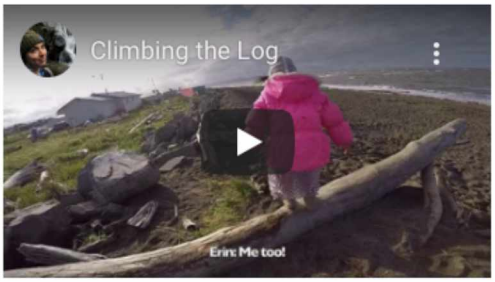
Children often seek out high places to gain a heightened view of the world (Green, 2018). Meeting the challenge of climbing a tall tree, a steep hill, a giant rock, provides children with feelings of strength and confidence. When facing these challenges, children may also navigate difficult emotional experiences, learning how to regulate feelings of stress or discomfort. This activity allows children to demonstrate and develop greater spatial autonomy. They gain environmental competencies, both as they gain physical skills of climbing and as they learn how to read and test different objects and substrates in the environment.

Climbing Boulders

Chloe sees all the boys climbing ahead of her on the boulders. She struggles to pull herself up onto the rocks and calls for help. However, after a moment, she realizes she has the strength to pull herself up. By the end of her climb she is confident enough to jump off the boulders and land on her feet.

Climbing Trees

Jennifer self-talks throughout her tree-climbing experiences. She lets us know her thoughts and feelings as she attempts to climb a tree. Although she becomes discouraged initially, she builds back confidence throughout the day. She understand the process of learning will take time and she must practice.



Climbing the Log

Sally joyously exercises her spatial autonomy as she climbs up a steep hill and deftly maneuvers across a long driftwood log. Although she is challenged as she climbs the hill, breathing heavily and using her hands to pull herself up, she continues to laugh throughout the experience.

Climbing the Bank

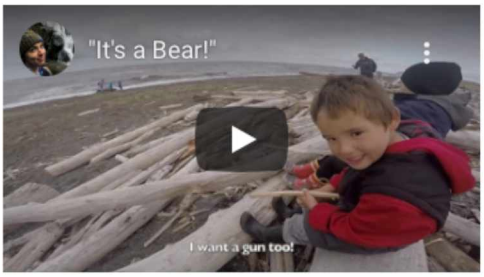
Samuel climbs up and down a steep riverbank. Throughout his video, we can see numerous children in the background, struggling or succeeding to climb up the same incline. We can hear Samuel's struggle as he makes his way up the bank, as well as his excitement when he is successful.

Imaginative Play

Imaginative play, pretend play, symbolic play, and dramatic play: all these terms refer to the use of imagination or role-playing in children's play activities. Natural environments can inspire children's imaginations to a greater degree than built environments like playrooms and playgrounds (Kiewra & Veselack, 2016; Zamani, 2016). Natural environments provide open-ended materials (leaves, rocks, sticks) that children can repurpose into anything they imagine (Kiewra & Veselack, 2016). Children can achieve greater spatial autonomy through imaginary scenarios and roleplaying that allow them to explore and enjoy the environment in new ways (Green, 2018).

Hunting a Bear

Samuel pretends to go hunting with Owen and Sean. The boys live in a Native village in rural Alaska, where subsistence hunting of bear and moose is common among families. Their pretending allows them to act out this important cultural practice, as they repurpose sticks into shotguns. Through this play, we also see how the boys socialize, work together, and share.



Finding a House

Joshua has slowly explored the cottonwood thicket for a few minutes when he begins to realize (and verbalize) that he's having fun. He walks into the thicket again and transforms it into his house. He finds "doors" in the branches, lifting them so he can follow new passageways. His exploratory behavior increases as he walks through the various rooms and hallways in his house.

Riding the Train

This video is from the viewpoint of an adult researcher. In this video, we see Philip sit down at the front of the driftwood log. He immediately transforms it into a train, simply by saying "Choo choo!" The girls sitting behind him quickly follow suit. The group is fluid and responsive to the actions of their peers. They continue to ride the train even after Philip has walked away.

Stick Play

Sticks and other "loose objects" found in the natural world inspire creativity and encourage immersive play behaviors (Kiewra & Veselack, 2016; Zamani, 2016; Storli et al., 2020). In our research, children used sticks as sword and guns, as wands and walking sticks, and as tools for exploring and manipulating the environment. Sticks often inspired pretend or imaginary behavior. We found that playing with or holding sticks encouraged children to practice greater spatial autonomy. Using sticks as tool to manipulate the environment may also build environmental competencies, as children gain a greater understanding of the materials, substrates, and physics of their environment.

Stick Swords

Justin finds a stick in the snow that becomes his sword. His pretends to sword-fight with friends, but the stick's usefulness does not end there. As they enter the woods, Justin imagines, or possibly truly feels, that "there might be dangers" ahead. Luckily, he has his stick swords, and he feels empowered to lead the group into the woods.

The Walking Stick

Emma finds her stick in the sand and carefully picks it up. She very slowly and intentionally makes use of it as a walking stick, using it to help pull herself up the steep sandy hill. She does not use the stick unthinkingly, but instead creatively explores its use as a tool. She begins to poke hole in the sand, making "pawprints."

Building Sandcastles

This brief video from the point of view of Chloe shows Anne and Erin uisng sticks to shape their sandcastles. Unlike the other scenarios in this list, the sticks did not inspire the activity. Rather, while trying to accomplish the task of building sandcastles, Anne saw the stick and realized its usefulness as a tool. Erin observed Anne's creativity, and Erin found another stick to use.

The Versatility of Sticks

In this video, Joseph interacts with sticks in a variety of ways. He sees a pile of sticks in the woods, and he wonders if beavers live there. He sees an especially tall stick, and he creatively discusses height andquality of this stick with Jennifer. He also finds and uses a stick as a tool to manipulate and explore the snow.

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